10/623953 C35

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Lehman et al. Attorney Docket No.: KLA1P015AD2

Patent: 6,885,190 B2 Issued: April 26, 2005

Title: IN-SITU METALIZATION MONITORING USING EDDY CURRENT MEASUREMENTS

CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the U.S. Postal Service with sufficient postage as first-class mail on June 10, 2005 in an envelope addressed to the Commissioner for Patents, P.O. Box 1450 Alexandria, VA 22313-1450.

Signed: _____
Aurelia M. Sanchez

REQUEST FOR CERTIFICATE OF CORRECTION OF OFFICE MISTAKE (35 U.S.C. §254, 37 CFR §1.322)

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450
Attn: Certificate of Correction

Dear Sir:

Attached is Form PTO-1050 (Certificate of Correction) at least one copy of which is suitable for printing. The errors together with the exact page and line number where the errors are shown correctly in the application file are as follows:

COVER PAGE:

1. In the "References Cited" section, please amend the following U.S. Patent information: change "4,476,430" to --4,475,430--. This appears correctly in the Information Disclosure Statement as filed on July 21, 2003.

SPECIFICATION:

1. Column 10, line 47, change "filler coverage" to --fuller coverage--. This appears correctly in the patent application as filed on July 21, 2003, on page 14, line 31.

CLAIMS:

1. In line 16 of claim 1 (column 18, line 9) change "N repetitious" to --N repetitions--. This appears correctly in Amendment A as filed on November 10, 2004, on page 2, paragraph 2, line 10.

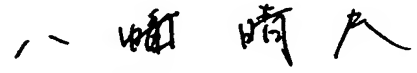
2. In line 11 of claim 2 (column 18, line 33) change "coductance" to --conductance--. This appears correctly in Amendment A as filed on November 10, 2004, on page 3, paragraph 1, line 2.

3. In line 13 of claim 2 (column 18, line 35) change "(g) and (b)" to --(g) and (h)--. This appears correctly in Amendment A as filed on November 10, 2004, on page 3, paragraph 1, line 3.

Patentee hereby requests expedited issuance of the Certificate of Correction because the error lies with the Office and because the error is clearly disclosed in the records of the Office. As required for expedited issuance, enclosed is documentation that unequivocally supports the patentee's assertion without needing reference to the patent file wrapper.

It is noted that the above-identified errors were printing errors that apparently occurred during the printing process. Accordingly, it is believed that no fees are due in connection with the filing of this Request for Certificate of Correction. However, if it is determined that any fees are due, the Commissioner is hereby authorized to charge such fees to Deposit Account 500388 (Order No. KLA1P015AD2).

Respectfully submitted,
BEYER WEAVER & THOMAS, LLP



Haruo Yawata
Limited Recognition under 37 CFR § 10.9(b)

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650-961-8300

Form 1449 (Modified) **Information Disclosure Statement By Applicant** (Use Several Sheets if Necessary)	Atty Docket No. **KLA1P015AD2/P611A2** Applicant: **Lehman *et al.*** Filing Date **Herewith**	Application No.: **Unknown** 10/623953 Group 2862 ~~Not Assigned~~

U.S. Patent Documents

Examiner Initial	No.	Patent No.	Date	Patentee	Class	Sub-class	Filing Date
LD	A21	5,660,672	8-26-97	Li, et al	—	—	
LD	A22	5,942,893	8-24-99	Terpay	—	—	
LD	A23	5,939,880	8-17-99	Logue	—	—	
LD	A24	5,389,876	2-14-95	Hedengren, et al	—	—	
LD	A25	5,754,043	5-19-98	Logue	—	—	
LD	A26	5,659,248	8-19-97	Hedengren, et al	—	—	
LD	A27	5,652,511	7-29-97	Pearse, et al	—	—	
LD	A28	5,606,260	2-25-97	Giordano, et al	—	—	
LD	A29	5,184,398	2-9-93	Moslehi	—	—	
LD	A30	4,942,545	7-17-90	Sapia	—	—	
LD	A31	5,510,709	4-23-96	Hurley, et al	—	—	
LD	A32	5,442,286	8-15-95	Sutton, et a	—	—	
LD	A33	5,122,743	6-16-92	Blakeley, et al	—	—	
LD	A34	6,040,695	3-21-00	Raulerson, et al	—	—	
LD	A35	5,781,009	7-14-98	Lee, et al	—	—	
LD	A36	5,617,024	4-1-97	Simpson, et al	—	—	
LD	A37	5,432,444	7-11-95	Yasohama, et al	—	—	
LD	A38	5,399,968	3-21-95	Sheppard, et a;	—	—	
LD	A39	5,278,500	1-11-94	Seitz	—	—	
LD	A40	5,242,524	9-7-93	Leach, et al	—	—	
LD	A41	5,093,626	3-3-92	Baer, et al	—	—	
LD	A42	3,851,242	11-26-74	Ellis	—	—	
LD	A43	2,920,269	1-5-60	Hanysz, et al	—	—	
LD	A44	4,475,430	10-9-84	Wright et al	—	—	
LD	A45	5,025,220	6-18-91	Colvin, et al	—	—	
LD	A46	3,986,105	10-12-76	Nix, et al	—	—	
LD	A47	2,629,004	2-17-53	M. L. Greenough	—	—	
LD	A48	3,761,804	9-25-73	Erich Steingroever	—	—	

Examiner Leena Khosla	Date Considered 7/28/04

Examiner: Initial citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

environmental conditions cause the vectors to drift within the graph in a particular manner. As shown, a temperature change causes the vectors to move towards the origin point. In contrast, an increase in probe-to-carrier distance causes a decrease in the carrier signal's magnitude. The measurement vector direction is also affected by the material composition. For example, ferrous vs. non-ferrous metals may be easily discerned.

Changes in temperature and/or probe-to-sample distance values may indicate a problem within the CMP system. For example, a significant decrease in probe-to-carrier distance may indicate that the pad of the CMP system requires replacement. By way of another example, a significant increase in temperature may indicate that the CMP system is overheating and corrective action is required. The temperature change may also be used to estimate endpoint. For example, as copper is removed, the friction coefficient of the copper changes, which change results in a change in the amount of heat generated by the copper rubbing against the pad and slurry. This change in temperature may then be directly correlated with the endpoint.

Additionally, variations (*e.g.*, variations in polishing rates, temperature, etc.) across the sample may also be determined during polishing and utilized to adjust the process on the fly (*e.g.*, to maintain uniformity). For example, if one portion of the sample is polishing at a slower rate than the rest of the sample, adjustments to the polishing parameters may be made to increase the polishing rate to the slower polishing sample portion. The adjustment techniques depend on the particular configuration of the polishing system. For instance, air bladders may be mounted behind the sample carrier to provide back pressure to the sample against the pad. Pressure may be increased to a particular sample portion by increasing the air content of one or more bladders located behind the particular sample portion. Thus, film may be removed uniformly across the sample. Other types of CMP systems may simply provide air holes or vacuum holes behind the wafer for controlling pressure. In these configurations, the amount of air or vacuum is simply decreased or increased to particular sample portions based on the level of unevenness in polishing rates.

The use of time history and spatially diverse measurements across the sample (e.g., radial measurements of thickness) gives a fuller coverage and better confidence level for determining endpoints. One can use the time history to determine the polishing rate, and the remaining thickness to determine the endpoints. The radial non-uniformity can also be determined and accounted for in the prediction of endpoints and/or polishing rate. Hence, a relatively high confidence level for endpoint prediction is obtained.

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (currently amended) A method for measuring conductance of a sample using an eddy current probe comprising a sensing coil, comprising:

(a) with the eddy current probe at a first separation from the sample, and with an AC voltage in the sensing coil, measuring a first voltage pair comprising in-phase and quadrature components of an induced AC voltage in the sensing coil;

(b) with the eddy current probe at the first separation from a reference material, and with the AC voltage in the sensing coil, measuring a second voltage pair comprising in-phase and quadrature components of an induced AC voltage in the sensing coil;

(c) calibrating the first signal based on the measured second signal;

(d) performing N repetitions of operations (a) and (b), where N is a positive integer, with the eddy current probe at a different separation from the sample and reference material during each of said repetitions;

(e) determining a conductance function relating conductance with location along [[the]] a selected curve; and

(f) after operations (a) through (e), processing the calibrated first voltage pairs obtained in operations (a) through (c) to generate a lift-off curve, determining an intersection voltage pair representing intersection of the lift-off curve with [[a]] the selected curve, and determining the conductance of the sample from the intersection voltage pair and the conductance function.

2. (currently amended) The method of claim 1, operation (f) further comprising:

(g) for each of several eddy current probe separations from a first reference sample of known conductance, and with an AC voltage in [[the]] a drive coil, measuring an induced voltage pair comprising in-phase and quadrature components of an induced AC voltage in the sensing coil, and processing said induced voltage pairs to generate a reference lift-off curve;

(h) repeating operation (g) for each of a number of different reference samples of known conductance; and

(i) processing the reference lift-off curves generated during operations (g) and (h) to determine reference intersection voltage pairs representing intersections of the reference lift-off curves with the selected curve, and generating the conductance function from said reference intersection voltage pairs.

3-6. (canceled)

PTO/SB/44 (10-96)
Approved for use through 6/30/99. OMB 0651-0033
Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

(Also Form PT-1050)

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 6,885,190 B2

DATED : April 26, 2005

INVENTOR(S) : Lehman et al.

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

In the Cover Page:

In the "References Cited" section, please amend the following U.S. Patent information: change "4,476,430" to --4,475,430--.

In the Specifications:

Column 10, line 47, change "filler coverage" to --fuller coverage--.

In the Claims:

In line 16 of claim 1 (column 18, line 9) change "N repetitious" to --N repetitions--.

In line 11 of claim 2 (column 18, line 33) change "coductance" to --conductance--.

In line 13 of claim 2 (column 18, line 35) change "(g) and (b)" to --(g) and (h)--.

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PATENT NO. 6,885,190 B2

No. of Additional Copies

BEFORE THE OFFICE OF ENROLLMENT AND DISCIPLINE
UNITED STATES PATENT AND TRADEMARK OFFICE

LIMITED RECOGNITION UNDER 37 CFR § 10.9(b)

Mr. Haruo Yawata is hereby given limited recognition under 37 CFR § 10.9(b) as an employee of Beyer Weaver & Thomas, LLP to prepare and prosecute patent applications wherein the patent applicant is the client of Beyer Weaver & Thomas, LLP, and the attorney or agent of record in the applications is a registered practitioner who is a member of Beyer Weaver & Thomas, LLP. This limited recognition shall expire on the date appearing below, or when whichever of the following events first occurs prior to the date appearing below: (i) Mr. Haruo Yawata ceases to lawfully reside in the United States, (ii) Mr. Haruo Yawata's employment with Beyer Weaver & Thomas, LLP ceases or is terminated, or (iii) Mr. Haruo Yawata ceases to remain or reside in the United States on an H-1 visa.

This document constitutes proof of such recognition. The original of this document is on file in the Office of Enrollment and Discipline of the U.S. Patent and Trademark Office.

Expires: January 2, 2007

Harry I. Moatz
Director of Enrollment and Discipline